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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,968	01/30/2004	Tzvi Avnery	2251.2013-001	4558

21005 7590 10/31/2007  
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.  
530 VIRGINIA ROAD  
P.O. BOX 9133  
CONCORD, MA 01742-9133

EXAMINER
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MAYEKAR, KISHOR

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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10/31/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/768,968	Applicant(s) AVNERY ET AL.	
	Examiner Kishor Mayekar	Art Unit 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 24-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/04</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of invention of Group I, claims 1-23 in the reply filed on 23 August 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Claim Rejections - 35 USC § 102 and § 103*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore,

Art Unit: 1795

the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by WO 02/26378 A1, a reference cited by Applicant. WO '378's invention is directed to a conversion of methane and hydrogen sulfide in non-thermal silent and pulsed corona discharge reactors. WO '378 discloses in Figs. 1 and 2 an apparatus comprising all the structures as claimed where WO '378's discharge reactors are read as the recited irradiation device.

5. Claims 1, 3, 5, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 93/11855, another reference cited by Applicant. WO '855's invention is directed to a method to purify gases and apparatus thereof. WO '855 discloses in Figs. 1 and 2 an apparatus comprises the recited irradiation chamber 9, e-beam device 1; separation

Art Unit: 1795

arrangement 5 and outlet, wherein charged particles are guided with an electromagnetic field to gather on the separation arrangement 5.

6. Claims 1-3, 9 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Etiviant et al. (US 6,245,309 B1), another reference cited by Applicant. Etiviant's invention is directed to a device for producing hydrogen by plasma reformer. Etiviant discloses in the abstract and Figs. 1-5 that the apparatus comprises all the structures as claimed where the silent discharge device read on the recited irradiation device

7. Claims 1, 4, 5, 10, 17-19, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-278802, another reference cited by Applicant. JP '802's invention is directed to a production of gaseous hydrogen and fuel cell. JP '802 discloses in the abstract and Fig. 1 an apparatus comprising all the structures as claimed where plasma discharge reactor is read as the recited irradiation device, rotating electrode creates centrifugal forces on the gaseous mixture to separate to an extent component's gaseous mixture based on density, and the AC power read on the recited waveform generator.

8. Claims 1, 2, 19, 20, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Bromberg et al. (US 5,409,784), another reference cited by Applicant. Bromberg's invention is directed to a plasmatron fuel cell system for generating

Art Unit: 1795

electricity. Bromberg discloses in Figs 1 and 3 that the system comprise all the structures as claimed where the plasma discharge reactor is read as the recited irradiation device, and the magnetic field generating device is read on the recited waveform generator.

9. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over each of the references applied above. The difference between each the applied reference as applied above and the instant claim 6 is the provision of a reaction chamber in communication with the first outlet for reacting the  $H^+$  ions with oxygen. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified each of the references as applied above because the manner or method in which the apparatus is to be utilized is not germane to the issue of patentability of the apparatus itself. The same is applied to the subject matter of claims 7 and 8 from Bromberg's teachings, since Bromberg discloses an electrical connection between the irradiation chamber and the reaction chamber.

10. Claims 2, 11 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '802. JP '802 as applied above further discloses in the Figure two outlets **111**. The difference between JP '802 and the instant claims is the provision of the second outlet for removing the larger constituent from the irradiation chamber. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the

Art Unit: 1795

invention was made to have modified each of the references as applied above because the manner or method in which the apparatus is to be utilized is not germane to the issue of patentability of the apparatus itself.

11. Claims 3, 12-14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '802 as applied to claims 2, 11 and 20 above, and further in view of Hemingway et al. (US 6,482,368 B2). The difference between JP '802 and the instant claim is the provision that the irradiation device is an electron beam. Hemingway teaches in a non-thermal plasma reactor for treating gas that the non-thermal plasma can be generated by an electron beam or electric discharge (col. 2, lines 340-48). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified JP '802's teachings as shown by Hemingway because the selection of any of known equivalent non-thermal plasma reactors would have been within the level of ordinary skill in the art.

12. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '802 as modified by Hemingway '368 as applied to claims 3, 12-14 and 21 above, and further in view of WO '378. The difference between the references as applied above and the instant claim is the provision of a recirculation passageway. WO '378 as applied above teaches the limitation in a non-thermal plasma reactor for treating gas (Fig. 1). The

Art Unit: 1795

subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by WO '378 because this would result in the conversion advantage.

As to the subject matter of claim 16, although WO '378 does not teach the use of a pump, since the outlet gas is at a lower pressure than the inlet gas, there is a difference in pressure in the irradiation chamber between the inlet and outlet, the return gas has to be pumped back into the irradiation chamber.

#### Conclusion

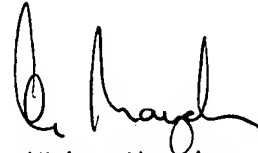
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on

Art Unit: 1795

access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Kishor Mayekar', is positioned above the printed name.

Kishor Mayekar  
Primary Examiner  
Art Unit 1795